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INDIRECT MASSAGE OF THE LENS FOR THE ARTIFICIAL RIPENING OF CATARACT.*

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At the meeting of the American Medical Association in 1892, Dr. Joseph A. White, of Richmond, Va., reported to the Section in Ophthalmology a series of cases in which the ripening of immature cataract had been hastened by the method suggested by Dr. T. R. Pooley, of New York (*New York Medical Journal*, December 26, 1885); and in the *Archives of Ophthalmology*, vol. xxi, No. 4, he published a paper upon the subject.

Since hearing Dr. White's report I have tested the method in a series of cases in which it seemed indicated by the presence of clear, soft cortex in the lens, and, finding it in the main satisfactory, desire to call your further attention to it. The following are abstracts of my notes on the cases in which the method was employed:

Case I.—R. C., a draughtsman, aged sixty-two years; always near-sighted; applied August 13, 1891, on account o recent increase in difficulty in seeing. Each lens presented a

* Read before the American Ophthalmological Society, July, 1893.

moderate nuclear haze with apparently normal vitreous and fundus. His correcting lenses and vision were: R. $-1{\cdot}50 \frown -0{\cdot}50$ cyl., axis $180° = \frac{5}{15}$; L. $-2{\cdot}50$ sph. $= \frac{5}{25}$.

He was fitted with these lenses and kept under observation. The nuclear opacity continued to increase, until before the operation for preliminary ripening vision with glasses had fallen to R. $\frac{5}{45}$, L. $\frac{3}{200}$.

On June 14, 1892, the anterior chamber was emptied with a paracentesis needle, and massage of the lens practiced through the cornea. No immediate effect on the lens was noticed. On the 15th there was considerable conjunctival hyperæmia and pericorneal injection. On June 21st there still remained some pericorneal injection and the opacity of the lens had much increased. Four days later all hyperæmia and irritability had subsided.

July 23d.—No fundus reflex could be obtained in any part of the dilated pupil. The iris cast no shadow, but there still appeared to be fragments of clear cortex near the anterior pole of the lens. He was told to wait until cooler weather for extraction; but meeting with an accident, which confined him to bed for some weeks, did not return until December. Simple extraction was done December 8th, the lens proving to be entirely opaque, above the average size, with a great deal of soft cortex, which, however, came cleanly away without difficulty. Healing was normal except for some adhesions of the iris to the upper lip of the corneal wound, and a high post-operative astigmatism, which diminished slowly.

March 13, 1893.—With the right eye he could count fingers at six feet; left, with $+8$ sph. $\frown +4$ cyl., axis 158°, vision $= \frac{4}{5}$ mostly.

Case II.—T. G., an iron worker, aged fifty-one years, had noticed failing sight for eight years in the left eye, and in the right for two months prior to his appearance at the clinic.

September 27, 1892.—His vision was, R. $\frac{5}{200}$; L. $\frac{1}{60}$.

In the right lens there was opacity of the anterior and posterior cortex in the lower portions, with good view of the fundus above. In the left there was nuclear and extensive cortical opacity, most dense at the anterior and posterior

poles, with good fundus reflex in the margin of the dilated pupil.

September 29th.—Paracentesis and indirect massage of the lens was done on the left eye. Immediately after the operation there was a faint gray reflex from the lens surface not previously present.

October 1st.—The eye was free from hyperæmia. There was slight increase in the lens opacity and the patient was permitted to leave the hospital and go home.

October 18th.—The opacity of the visible cortex was complete. The anterior chamber distinctly more shallow than in the other eye.

October 20th.—Lens extracted, proving to be large with much soft cortex, which came away completely. There was more than the average reaction following extraction and slight iritis. However, in two weeks the eye was almost free from hyperæmia; pupil free and circular.

December 6th.—Without needling the capsule his correcting lens and vision were: R. $-0{\cdot}50 \smile + 1{\cdot}75$ cyl., axis $30° = \frac{5}{15}$: L. $+8 \frown + 2{\cdot}50$ cyl., axis $170° = \frac{5}{10}$.

Case III.—W. S., aged fifty-two years, piano maker. Finds all glasses that he can get unsatisfactory.

February 4, 1892.—Vision, R. $\frac{5}{20}$; L. $\frac{5}{30}$. Right, high mixed astigmatism and cortical opacity of lens in lower temporal quadrant, which does not encroach on the undilated pupil. Left, high astigmatism, radiating and cloudy opacity in both the anterior and posterior cortex, with full fundus reflex through most parts of the lens. R. $+ 2{\cdot}75$ sph. $\frown - 5$ cyl., axis $180° = \frac{5}{10}$; L. not improved.

He was seen from time to time, vision continuing to grow worse until December 24th. In the left eye he was then only able to count fingers at two feet. Paracentesis with indirect massage of the lens was practiced.

December 27th.—Counts fingers at eighteen inches. Slight pericorneal redness. No appreciable change in the lens.

December 31st.—Counts fingers at nine inches. Marked increase of lens opacity. Eye free from hyperæmia.

January 5, 1893.—Vision reduced to perception of moving

objects. Anterior portions of the lens opaque. Lens removed by simple extraction. Posterior cortex still fairly clear. The healing was normal.

March 18th.—R. with + 12 sph. ⌣ + 0·75 cyl., axis 145°, vision = $\frac{5}{10}$ without secondary operation.

Case IV.—Mrs. J. G. B., aged sixty-four years, had noticed failure of vision in right for one year and in left for three months before applying, January 14, 1893. She has been wearing concave spherical lens 4 D. Vision: R. counts fingers at twelve inches; L. $\frac{5}{30}$.

The right pupil was occupied by gray opacity tinged with faint red reflex. The upper portion of the lens seemed slightly hazy throughout, with more dense opacity near the anterior and posterior poles. The left eye presented opacity mainly in the posterior cortex of the lower outer third of the lens with one spicule in the anterior cortex.

January 28th.—Condition unchanged. Paracentesis and indirect massage done on the right eye. After the operation there was a faint gray film at the surface of the lens, and a slight pink or faint claret color to the whole aqueous humor, probably from slight hæmorrhage of the iris. Two days later the eye was quite free from hyperæmia and no trace of red reflex visible in the pupil. Simple extraction was done February 7th.

April 22d.—Without needling the capsule her correcting lenses and vision were: R. + 8 ⌒ + 0·75 cyl., axis 180° = $\frac{5}{7}$.

Case V.—Mrs. H., aged thirty-three years, housework. Several years ago first noticed failing vision in the right eye, and for the past three years there has been similar failure of the left.

February 14, 1893.—The right eye presents diffused opacities of the lens, hiding the condition of the vitreous and all details of the fundus. Good fundus reflex in all directions. Left nuclear opacity of lens; fundus dimly seen, apparently normal, and normal vitreous. Vision: R. $\frac{1}{30}$; L. $\frac{5}{30}$, slightly improved by a — 0·50 D. sph.

April 6, 1893.—No change in the condition of the eyes under treatment. No improvement by glasses. Vision the same.

I did paracentesis and indirect massage on the right eye, taking special care to withdraw all aqueous and making more vigorous and prolonged massage than in any of the previous cases. At the close of the operation a slight film was noticed at the anterior surface of the lens.

April 8th.—Free from hyperæmia. The film before noticed has disappeared.

April 20th.—The lens remains precisely as before the operation. Vision unchanged. Made small incision in the anterior capsule with Bowman's stout needle.

May 23d.—There is still but a very small strictly localized opacity at the seat of puncture of the anterior capsule. Vision, $\frac{1}{5}\frac{1}{0}$. Extracted a comparatively clear lens, which came away completely through a rather small incision.

June 15th.—The eye free from irritability. Some wrinkling and opacity of capsule with diffused and localized opacities of the vitreous. The capsule was freely incised, and July 12th, with $+ 9 \frown + 4$ cyl., axis 10°, vision $= \frac{5}{1}\frac{5}{5}$ partly.

Case VI.—Lewis C., aged fifteen years, peddler. Two years ago had pain and inflammation in the right eye attended with failure of vision.

February 18, 1893.—Drooping of the right upper lid, excluding that eye from vision. Chronic conjunctivitis with thickening of the lids. Pupils equal, normal. Right eye slightly divergent. Diffused cloudy opacity, apparently near the anterior surface of the lens. Good fundus reflex in all directions. Vision equal to $\frac{1}{5}\frac{1}{0}$. Left eye, hyperopia: 1 D.; media clear; vision, $\frac{5}{5}$.

March 18th.—No change in the right eye under treatment. Paracentesis and indirect massage of the lens, decidedly more vigorous than I commonly employed, produced no perceptible change in the opacity.

June 24th.—Vision, $\frac{1}{5}\frac{1}{0}$. Appearance of lens as when first seen.

Case VII.—A. O. S., aged sixty years, compositor. Had noticed failure of vision in the right eye for three years, progressive.

April 22d.—Vision. R., counts fingers at four inches. L. $\frac{5}{1}\frac{5}{0}$.

By dilatation of the right pupil, vision was increased to counting fingers at four feet. The whole lens was found hazy, but with perceptible red reflex showing through it in all portions, there being no dense localized opacities. L., vision normal.

April 25th.—Paracentesis and indirect massage were done on the right eye.

April 27th.—Vision unchanged, red reflex still distinct in all portions of the pupil, eye free from hyperæmia.

May 2d.—With fully dilated pupil, counts fingers at ten inches. There is still faint red reflex visible through certain parts of the lens; marked increase of opacity in the anterior cortex.

May 9th.—No red reflex. Vision reduced to light perception.

May 23d.—Lens, mainly soft cortex, portions of the posterior layers of which were comparatively clear, was removed by simple extraction. Recovery normal.

July 7th.—11 D. sph. ⌒ + 3 cyl., axis 190°. Vision = $\frac{2}{3}$.

As regards the efficiency of the operation, it will be noticed that the cases here reported may be divided into two groups. Case V, aged thirty-three years, and Case VI, aged fifteen years, showed no change whatever in the condition of the lens opacity as a result of the operation. As regards these cases, it was quite ineffective. The other five cases, ranging from fifty-one to sixty-four years of age, all show rapid and satisfactory increase in the lens opacity as the result of operation.

The practical efficiency of the operation is seen by the fact that in all five cases the vision was speedily reduced to light perception, all red reflex abolished, the extraction was complete, and good vision was obtained without any secondary operation.

I believe that in nearly all cases after extraction there comes a time when the vision is markedly improved by

division of the capsule, and that in the majority a secondary operation will give better vision from the start. The point of importance here is that in these cases the indications for division of the capsule were no greater than after the extraction of cataracts that have attained complete maturity without surgical interference.

In the matter of efficiency my experience indicates that indirect massage is decidedly superior to Förster's operation. It would appear, however, that it is efficient only in senile cataract—that is, only when the opaque lens contains a rather large, firm nucleus.

In support of this, my colleague, Dr. A. D. Hall, informs me that he has twice tried the operation for juvenile cataract with precisely the same experience, not the slightest effect being produced on the lens opacity.

As regards the safety of the operation, I can only say that the ocular and physical conditions in these cases were not more favorable than in the average of cataract cases, yet they exhibited little more reaction than would be expected from the puncture of the cornea and the withdrawal of the aqueous humor. There has not been any sign of iritis, or a single posterior synechia; and the eyes all did well at the time of extraction and subsequently.

There was nothing like dislocation of the lens produced in any case, nor do I think such an accident could ever result from the manipulations necessary to effect the desired maturity of the cataract, except in eyes in which it is liable to occur spontaneously, or from any slight blow or jar of the head.

As to the need for such an operation, it seems to me very important, both for physical, mental, and economic reasons, that cataract should be removed as soon as it has reached visual maturity—that is, so soon as it greatly interferes with the independence and comfort of the patient

if its removal is at all likely to restore the patient to comfort and independence. If, then, it is best that a cataract should also be surgically mature, that the lens should be completely opaque before its removal is undertaken, the need for such an operation as this seems clear and imperative. But whether it is really best to always secure complete opacity of the lens before proceeding to extract it may still be questioned. My own experience in extracting immature cataracts which still have some soft cortex, without a previous ripening operation, has been less satisfactory than that detailed with reference to this operation; yet, on the whole, it has been by no means unsatisfactory, and something might be said in favor of extracting immature cataracts as against their previous maturation.

The Method of Operating.—After the full dilatation of the pupil and the free instillation of cocaine, the anterior chamber is tapped with a paracentesis needle or broad needle, the incision being kept open by the point of the needle until the aqueous has been completely withdrawn with some little pressure of the fingers through the lids upon the globe. I use the fingers for fixation without a speculum. Then a tortoise-shell spatula is pressed upon the cornea within the area of the pupil and rubbed around in a circle, and then in radiating lines, stroking from the center toward the periphery of the cornea. During this latter manipulation the margin of the pupil will be seen to retreat before the spatula, so that a large part of the anterior surface of the lens can be acted on without pressure upon the iris. The manipulation is continued a minute and a half to two minutes and a half.

The after-treatment consists of closing the eye for a few hours, and the subsequent instillation of a mydriatic, until the eye is free from hyperæmia. The preliminary instillation of cocaine is repeated three or four times,

using it more freely than I would for cataract extraction, with the idea of rendering the cornea more flexible.

To summarize my conclusions with reference to this method of ripening cataract:

It seems more certainly efficient than Förster's.

It is almost entirely free from danger.

It is probably a better means of avoiding prolonged practical blindness than the extraction of the immature cataract.

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